DOCUMENT RESUME

ED 116 177 CS 002 341

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TITLE Memory Attribute Dominance in High and Low SES Kindergarten Children.
PUB DATE 75
NOTE 11p.; Paper presented at the Annual Meeting of the American Psychological Association (83rd, Chicago, Illinois, August 30-September 3, 1975); Not available in hard copy due to marginal legibility of original document

EDRS PRICE MF-$0.76 Plus Postage. HC Not Available from EDRS.
DESCRIPTORS *Association (Psychological); Associative Learning; *Auditory Discrimination; Auditory Perception; Cognitive Processes; Kindergarten; *Memory; Primary Education; *Recall (Psychological); Retention; *Socioeconomic Status

ABSTRACT

False recognition responses of high and low SES kindergarten subjects to associatively and acoustically related words were measured. Acoustic attribute dominance for all subjects, and relatively greater acoustic attribute dominance for low SES subjects was predicted. Results indicated that subjects encoded on both attribute dimensions, with low SES subjects producing significantly more recognition errors. The importance of the results for the developmental shift hypothesis of attribute dominance was discussed as well as the importance of SES as a variable in future memory attribute research. (Author)

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Memory Attribute Dominance in High and Low SES Kindergarten Children

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Paper presented at the annual meeting of the American Psychological Association, Chicago, September, 1975.

SUMMARY

Memory Attribute Dominance in High and

Low SES Kindergarten Children

Verbal memory has been conceptualized by Underwood (1969) as a process of abstracting and storing information about a verbal unit such as a word. This encoded information, according to Underwood, is actually an ensemble of many different attributes which can serve to discriminate one memory from another, and act as retrieval mechanisms for a particular target memory.

Recently, two memory attributes have received a great deal of experimental attention because of their developmental significance. It was hypothesized (Underwood, 1969) that in young children the acoustic attribute would dominate their memory for words, while in older children and adults the associative-verbal attribute would be dominant. Specifically, it was thought that a developmental shift from acoustic to associative encoding would occur because as the child ages he is exposed to more and more language learning experiences (especially in school) that are associative in nature.

Bach and Underwood (1970) directly tested the developmental shift hypothesis of attribute dominance using a multiple-choice false recognition task. They found the predicted change between second- and sixth-grade subjects. Other investigators, however, have obtained results not fully supportive of the Bach-Underwood findings. Hall (1972) did not find predicted acoustic false recognitions among South American children with fewer years of school attendance. Ghatala and Hurlbut (1973) found that second-grade subjects produced superior recall using conceptual rather than acoustic retrieval cues. Hall and Halperin (1973) found nearly equal numbers of associative and acoustic false recognition responses in 3-, 4-, and 5-year olds. Young (1971) found a predominance of associative over acoustic encoding for both second- and sixth-grade subjects. Finally, Freund and Johnson (1972) replicated the Bach-Underwood study, testing for the orthographic attribute

as well as the acoustic and associative attributes. Their first-grade subjects were more likely to encode a word by its orthographic features than either its acoustic or associative features, and they speculated that "the acoustic attribute appeared dominant in the Bach and Underwood (1970) study because it was a combination of the orthographic and acoustic attributes" (p. 389).

The purpose of the present study was twofold. First, using a running recognition procedure modeled after Underwood (1965) an attempt was made to determine the relative importance of the acoustic vs. the associative attribute for kindergarten subjects. Underwood's (1969) hypothesis predicts that the acoustic attribute should dominate for this age group. Second, an extension of the developmental shift hypothesis to the variable of socioeconomic status (SES) was tested. Numerous studies (e.g., John, 1963; Entwisle, 1968) suggest that the lower class learning environment depresses a child's ability to produce higher order associations, while the middle class environment actively stimulates this ability. It was therefore expected that lower SES subjects would tend to encode words acoustically while high SES subjects would encode associatively.

Method

Subjects

There were 25 high SES and 25 low SES kindergarten subjects in the experiment. The mean ages of the two groups were 5.2 years and 5.5 years respectively. Approximately equal numbers of boys and girls in each group were chosen. All of the low SES children were enrolled in Head Start programs, lived in an economically depressed rural area of upstate New York, and had fathers whose occupational status was either semi-skilled or unskilled. The high SES children all attended a campus laboratory school, lived in a

moderate size city, and had fathers whose occupational status was either skilled or professional. Many of the high SES children were sons and daughters of local college professors.

Materials and Procedure

A word association test was first administered to 40 high SES and 40 low SES subjects so that associative strengths of words used in the later recognition list could be equated for the two social class groups. From the 40 words tested, eight stimulus-response associates were chosen for inclusion in the recognition list. Mean associative strengths were 63% and 50% for the high SES and low SES subjects, respectively.

A 60 item word recognition list was constructed using the eight stimulus words and their associates as critical stimulus (CS) and experimental (E_{as}) words, respectively. In addition, eight acoustically related experimental (E_{ac}) words were chosen by the experimenter; one rhyming word for each CS word. Each of the 16 E words had a control (C) word that bore no associative or acoustic relationship to any other word on the list, immediately adjacent to it. Finally, there were 10 repeated (R) words that occured twice in the list. Table 1 shows the entire recognition list, together with the function of each word.

Each subject was tested individually by the experimenter. Several practice trials preceeded each testing to familiarize the subject with the procedure. The list was read slowly by the experimenter with the subject instructed to say either "yes" or "no" after each word to indicate whether he thought the word had been read earlier on the list.

Results

Table 2 gives the mean number of E and C words to which subjects in t

two SES groups responded "yes" (ie., as having occured previously in the list). Clearly, more false positives occured to both acoustic and associative E words than to their respective C words. A 2 x 2 x 2 analysis of variance (SES x Error Type x Word Type) yielded a significant main effect of Word Type, F (1, 48) = 29.61, $p < .01$. Across both social class groups significantly more recognition errors were made to Acoustic E words and Associative E words than to their respective control words (t (49) = 5.68, $p < .01$ and t (49) = 4.65, $p < .01$). A Newman-Keuls test applied to all eight means indicated that none of the four C word means differed significantly from each other, and that of the four E word means only the Low SES-Acoustic and Low SES-Associative differed significantly from each other and from their C word means (all $ps < .05$).

Using the E-C word difference scores, a second analysis of variance was performed to directly test the predicted false recognitions. Neither the main effect of Error Type or the Error Type x SES interaction was statistically significant. However, a significant SES main effect (F (1, 48) = 5.61, $p < .05$) indicated that Low SES subjects produced reliably more false recognitions than High SES subjects, of both types. Table 3 shows the mean E-C difference scores.

Conclusions

The results of the present study do not support the developmental hypothesis (Underwood, 1969; Bach and Underwood, 1970) of acoustic attribute dominance in young children's memory for words. Rather, significant associative and acoustic false recognitions suggest that the present kindergarten subjects were encoding on both attribute dimensions. While there was a trend toward more acoustically based errors, the overall results tend to support the more recent findings of Hall and Halperin (1972).

Likewise, the predicted extension of the developmental hypothesis to the variable of social class was not confirmed due to the nonsignificant Error Type x SES interaction. It is important to note, however, that the Low SES subjects were more prone to false recognition errors than their High SES counterparts, and of these errors, the acoustic were clearly predominant. This suggests that while Low SES subjects encoded on both attribute dimensions, they did show some preference for the acoustic attribute. The potential of social class level as a predictor of attribute dominance appears great. Its inclusion in future research with older subjects is suggested.

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Table 1

Recognition Memory List

Word	Function	Word	Function
tiger	R	soccer	E_{ac}
join	R	group	R
window	R	listen	R
mother	CS	fault	E_{ac}
tiger	R	church	C_{ac}
doctor	CS	pepper	E_{as}
join	R	town	C_{as}
listen	R	ocean	R
circle	R	cool	C_{as}
salt	CS	bad	E_{as}
good	CS	laugh	C_{ac}
ocean	R	should	E_{ac}
scissors	CS	sisters	E_{ac}
yellow	R	name	C_{ac}
window	R	farm	R
slow	CS	cut	E_{as}
farm	R	sell	C_{as}
off	CS	kind	C_{as}
group	R	fast	E_{as}
her	CS	turn	C_{ac}
moon	R	blow	E_{ac}
circle	R	cough	E_{ac}
father	E_{as}	power	C_{ac}
gate	C_{as}	on	E_{as}
pipe	C_{as}	into	C_{as}
nurse	E_{as}	moon	R
yellow	R	it	C_{as}
other	E_{ac}	him	E_{as}
rope	C_{ac}	draw	C_{ac}
face	C_{ac}	stir	E_{ac}

Legend

R: Repeated Word

CS: Critical Stimulus Word

E_{as}: Experimental Word-Associate

E_{ac}: Experimental Word-Acoustic

C_{as}: Control Word-Associate

C_{ac}: Control Word-Acoustic

Table 2

Mean Recognition Errors to Associative and Acoustic Experimental (E) and Control (C) Words as a Function of SES

	Associative		Acoustic	
SES	E	C	E	C
High	.72	.24	.84	.36
Low	1.28	.32	2.08	.60

Note. Maximum score = 8

Table 3

Mean Number of Associative and Acoustic Recognition Errors Corrected for Control Word Errors

SES	Associative	Acoustic
High	.48	.48
Low	.96	1.48

Note. Maximum score = 8